CLAIMS

WHAT IS CLAIMED IS:

1. A method for detecting an error in a transmission in an ultra-wideband communications system, the transmission including a plurality of frames, comprising the steps of:

transmitting a frame of the transmission, the frame including a positive timing window and a negative timing window, the frame including a bipolar pulse pair, the bipolar pulse pair including a positive pulse and a negative pulse;

generating the negative pulse to have an amplitude and a pulse width equal to an amplitude and a pulse width of the positive pulse;

positioning the positive pulse in the positive timing window and the negative pulse in the negative timing window, the position of the negative pulse in the negative timing window corresponding to the position of the positive pulse in the positive timing window;

receiving the positive pulse and the negative pulse; and

before receiving the complete transmission, correlating the received positive pulse and the received negative pulse in determining whether a correlation error has occurred in the transmission of the positive pulse.

2. A method according to claim 1, further comprising the steps of:

after receiving the pulse train, determining a data type of the ultra-wideband transmission and calculating an error rate for the ultra-wideband transmission;

if the calculated error rate is less than a Typical Minimum Acceptable Bit Error Rate (TMABER), then sending the ultra-wideband transmission to a desired destination;

if the calculated error rate is greater than the TMABER and less than a Maximum Bit Error Rate For Correction (MBERFC), then error correcting the ultra-wideband transmission before sending the ultra-wideband transmission to the desired destination; and

if the calculated error rate is greater than the MBERFC, then requesting the re-transmission of the ultra-wideband transmission.

3. The method according to claim 1, wherein the transmission includes at least one of a data signal, a video signal and an audio signal.

4. The method according to claim 1,

wherein the step of transmitting includes the step of partitioning each of the positive timing window and the negative timing window into an equal number of timing slots, each timing slot having the same time duration, and

wherein the step of positioning includes the steps of placing the positive pulse in a particular timing slot of the positive timing window and placing the

negative pulse in an equivalently positioned timing slot of the negative timing window.

5. A method for encoding and decoding an ultra-wideband transmission, comprising the steps of:

transmitting a pulse train including a plurality of bipolar pulse pairs, each bipolar pulse pair including a positive pulse and a negative pulse, each bipolar pulse pair being disposed in a frame, the frame including a positive timing window and a negative timing window;

generating the negative pulse to have an amplitude and a pulse width equal to an amplitude and a pulse width of the positive pulse; and

positioning the positive pulse in the positive timing window and the negative pulse in the negative timing window, the position of the positive pulse in the positive timing window encoding information within the frame, the position of the negative pulse in the negative timing window corresponding to the position of the positive pulse in the positive timing window.

6. A method according to claim 5, further comprising the steps of:

receiving the positive pulse and the negative pulse; and

before receiving completely the pulse train, correlating the received positive pulse and the received negative pulse in determining whether a correlation error has occurred in the transmission of the received bipolar pulse pair.

7. A method according to claim 6, further comprising the steps of:

counting the number of correlation errors in a portion of the ultra-wideband transmission; and

if the number of correlation errors exceeds a particular threshold, then requesting the re-transmission of the ultra-wideband transmission.

8. A method according to claim 7, further comprising the steps of:

after receiving the pulse train, determining a data type of the ultra-wideband transmission and calculating an error rate for the ultra-wideband transmission;

if the calculated error rate is less than a Typical Minimum Acceptable Bit Error Rate (TMABER), then sending the ultra-wideband transmission to a desired destination;

if the calculated error rate is greater than the TMABER and less than a Maximum Bit Error Rate For Correction (MBERFC), then error correcting the ultra-wideband transmission before sending the ultra-wideband transmission to the desired destination; and

if the calculated error rate is greater than the MBERFC, then requesting the re-transmission of the ultra-wideband transmission.

9. A system for detecting an error in a transmission in an ultra-wideband communications system, the transmission including a plurality of frames, comprising:

means for transmitting a frame of the transmission, the frame including a positive timing window and a negative timing window, the frame including a bipolar pulse pair, the bipolar pulse pair including a positive pulse and a negative pulse;

means for generating the negative pulse to have an amplitude and a pulse width equal to an amplitude and a pulse width of the positive pulse;

means for positioning the positive pulse in the positive timing window and the negative pulse in the negative timing window, the position of the negative pulse in the negative timing window corresponding to the position of the positive pulse in the positive timing window;

means for receiving the positive pulse and the negative pulse; and

means for correlating the received positive pulse and the received negative pulse in determining whether a correlation error has occurred in the transmission of the positive pulse before receiving the complete transmission.

10. A system for encoding and decoding an ultra-wideband transmission, comprising:

means for transmitting a pulse train including a plurality of bipolar pulse pairs, each bipolar pulse pair including a positive pulse and a negative pulse, each bipolar pulse pair being disposed in a frame, the frame including a positive timing window and a negative timing window;

means for generating the negative pulse to have an amplitude and a pulse width equal to an amplitude and a pulse width of the positive pulse; and

means for positioning the positive pulse in the positive timing window and the negative pulse in the negative timing window, the position of the positive pulse in the positive timing window encoding information within the frame, the position of the negative pulse in the negative timing window corresponding to the position of the positive pulse in the positive timing window.